

REMARKS

Claims 1-11, 13, 14 and 17-20 are pending in the above-captioned application, all of which stand rejected under 35 U.S.C. §103(a), as well as being provisionally rejected under the doctrine of obviousness-type double patenting. Reconsideration and allowance of all claims is respectfully requested.

Applicants gratefully acknowledge the interview held on October 5, 2005, between Examiner Piazza Corcoran, inventor Robert A. Mercuri and the undersigned, at which time the patentable distinctions between the invention of the above-captioned application and the disclosures of the cited art were discussed, and sample bipolar plates exhibited.

Rejections Under 35 U.S.C. §103(a)

Claims 1-9, 11, 13, 14 and 17-20 stand rejected under 35 U.S.C. §103(a) over Dettling et al. (U.S. 4,732,637), in view of Chi (U.S. 4,416,955) and/or van Ommering (U.S. 4,565,749) and further in view of Mercuri et al. (U.S. 6,037,074).

Claim 10 stands rejected under 35 U.S.C. §103(a) over Dettling et al., in view of Chi and/or van Ommering and Mercuri et al. '074, and further in view of Edginton et al. (U.S. 5,589,301).

Claims 9 and 10 stand rejected under 35 U.S.C. §103(a) over Dettling et al., (optionally in view of Chi and/or van Ommering) in view of Mercuri et al. '074, and optionally in view of Edginton et al. and further in view of Selover, Jr. et al. (U.S. 4,014,730).

Claims 1-9, 12, 13, 15 and 16 stand rejected under 35 U.S.C. §103(a) over Dettling et al. in view of Chi and/or van Ommering and further in view of Mercuri et al. (U.S. 6,432,336).

Claims 9 and 10 stand rejected under 35 U.S.C. §103(a) over Dettling et al., in view of Chi and/or van Ommering and Mercuri et al. '336, and further in view of Selover, Jr. et al.

Claims 1-9, 11, 13-14 and 17-20 stand provisionally rejected under the doctrine of obviousness-type double patenting over claims 1-9 of copending application Serial No. 10/185,085, in view of Dettling et al. in view of Chi and/or van Ommering et al. and further in view of Mercuri '074.

Claim 10 stands provisionally rejected under the doctrine of obviousness-type double patenting over claim 13 of copending application Serial No. 10/185,085, in view of Dettling et al. in view of Chi and/or van Ommering et al., Mercuri '074 and Edginton et al.

Claims 1-11, 13-14 and 17-20 stand provisionally rejected under the doctrine of obviousness-type double patenting over claims 1-16 of copending application Serial No. 10/477,989, in view of Dettling et al., Chi, van Ommering et al., Mercuri '074, Edginton et al. and/or Selover, Jr. et al.

As a first point, the Office Action acknowledges that the rejections which include the Mercuri et al. '336 patent will be withdrawn upon a showing that the Mercuri et al. '336 invention and that of the above-captioned application were commonly owned at the time they were made. As shown on the cover page of the Mercuri et al. '336 patent, the owner of the patented invention is Graftech Inc. of Wilmington, Delaware. As shown in the public records of the Patent Office, the assignee of the above-captioned application is also Graftech Inc. of Wilmington, Delaware. Thus, this represents at least prima facie evidence that the Mercuri et al. '336 invention and that of the above-captioned application were commonly owned at the time they were made and the rejections over Mercuri et al. '336 should be withdrawn.

In addition, during the interview on October 5, 2005, bipolar fuel cell flow field plates made in accordance with the present invention and plates made in accordance with the prior art were exhibited. It was shown that the bond between the plates formed when the inventive method is employed is substantially stronger than the bond formed by prior art methods. Indeed, the bond between the plates formed by the inventive method is so strong that the plates themselves split before the bond breaks. Contrariwise, in the prior art methods, the bond fails before the plates split; thus the prior art bond is not sufficiently strong for the intended use.

It was agreed during the interview that if this state of facts is established via a sworn declaration, the patentable distinctions between the claimed method of the above-captioned application and that of the prior art, especially Dettling et al., the claims rejected thereover passed to allowance. Therefore, appended hereto is a Declaration of Robert A. Mercuri, inventor on the above-captioned application, establishing that a bipolar fuel cell flow field plate formed of compressed particles of exfoliated graphite was prepared in accordance with the method of the present invention, and a bipolar fuel cell flow field plate formed of compressed particles of exfoliated graphite was prepared by the method of the prior art. The plates were then separated by hand, using sufficient force to break the plates apart from each other.

As established by Mr. Mercuri, in the case of the bipolar plate formed in accordance with the above-captioned application, the plates themselves broke, demonstrating that the bond formed between the two plates was stronger than the plate material itself. In the case of the bipolar plate formed in accordance with the prior art, the bond between the plates separated, leaving two intact plates.

Thus, the rejections under 35 U.S.C. §103(a) should be withdrawn.

With respect to the provisional rejections under obviousness-type double patenting, the appropriate Terminal Disclaimer(s) will be provided if and when one or both of the copending applications which form the basis for the rejections is granted prior to the grant of the above-captioned application.

In summary, the above-captioned application provides a cost effective process for manufacturing plates readily joined as bipolar plates, and which are useful in conventional and in liquid cooled fuel cell systems. Dettling et al. describes foraminous plates made impermeable in the through thickness direction in the process of assembling into the bipolar configuration. Dettling et al. is not making bipolar plates from adequate plates; but, using the assembly process to give function (separate and direct the reactants) to plates that would otherwise be unusable in stacked configuration.

Chi does not mention bipolar plates; the object of the invention is "to provide a fuel cell sub-assembly which is adapted to facilitate removal of such sub-assembly from others" column 1, lines 37-40. The Chi sub-assembly is defined as a "plurality of fuel cells" col. 2 line 25. A bipolar plate is in fact one half of the reactant delivery structure for two adjacent cells. The interlocking seals of Chi are not an attribute of cell construction but of "adjacent cooling plates" – one half of the cooling plate is on one side of a plurality of cells and the mating half on the other – the sub-assemblies are assembled one to another and it is in that regard that "the interface between the plates can be further facilitated by providing the cooling plates with male and female joints" col.3 lines 45-47.

Van Ommering describes a tongue and groove of a dielectric (plastic) frame to confine electrolyte, col. 3, 18-21, the bipolar aspect pertains only when "nickel metal tabs external to the frame" are welded together "following stack assembly," col. 6 lines 9-12.

Selover Jr. et al. teaches what is not available - .3 mils of graphite foil- though it is claimed that it "readily available," col. 1 line 65 - the thinnest foil available at the time of the Selover patent was 5 mils, about 20x claimed. Currently, the thinnest graphite foil available is 3 mils or 10 times what is

claimed. Selover bonds two sheets of graphite together by hot pressing with a layer of elastomer that is preferentially vulcanized with times of 1 minute to 24 hours under pressure 15 to about 15,000 psi from room temperature to 220°C. The above-captioned application relates to resins, not elastomers; the multifunctional systems are often cured at temperatures greater than 220°C and without load.

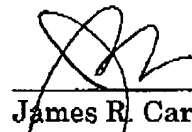
Schmid first speaks of an MEA, not a flow field plate or bipolar plate; moreover, the Office Action asserts the Schmid apparatus has an operative side and a back side having protrusions, which is nowhere stated in the patent. There simply is no place in Schmid where a protrusion and groove is used in sealing – all plates have seal grooves.

Conclusion

Based on the foregoing amendments and remarks, it is belied that all claims 1-11, 13, 14 and 17-20 of the above-captioned application are not in condition for allowance. Such action is earnestly sought. If there remains any matter which prevents the allowance of any of these claims, the Examiner is requested to call the undersigned "collect" at 615.242.2400 to arrange for an interview which may expedite prosecution.

Applicants hereby petition to Commissioner for an extension of time of 3 months to respond to the outstanding Office Action, extending their time to respond to January 3, 2006. The Commissioner is authorized to charge the extension fee of \$1020 and the RCE fee of \$790, as well as any deficiency associated with the filing of this Response, to Deposit Account 50-1202.

Respectfully submitted,



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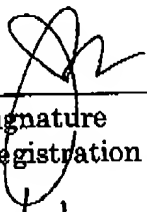
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CERTIFICATE OF FACSIMILE TRANSMISSION

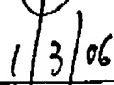
I hereby certify that this **RESPONSE TO OFFICE ACTION**, including petition for extension of time and certificate of facsimile transmission (10 pages), RCE (1 page) and Declaration of Robert A. Mercuri (5 pages) is being facsimile transmitted to the United States Patent and Trademark Office, Fax No. 571.273.8300.

James R. Cartiglia



Signature

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Date